

FIG. 1

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Summary of sequence differences between the infectious cDNA clone and parental WNV strain 3356

Nucleotide no. ^a	Strain 3356 genome	cDNA clone	Amino acid change	Location
1285	T	C	Silent	E
3840	T	C	Silent	NS2A
7015	C	T	Silent	NS4B
7826	T	C	V → A	NS5
8067	G	A	Silent	NS5
8859 ^b	C	A	Silent	NS5
8862 ^b	A	G	Silent	NS5
8880 ^c	A	G	Silent	NS5
9123	C	T	Silent	NS5
10613	C	T	Silent	3'UTR
10783	C	T	Silent	3'UTR

^a Nucleotide position and sequence are based on WNV strain 3356 (GenBank accession no. AF404756).

^b Mutations were designed to generate an endonuclease *Sst*I site as a marker for recombinant virus.

^c This mutation was designed to knock out the endonuclease *Eco*RI site as a marker for recombinant virus.

FIG. 2

Genome
Transcript

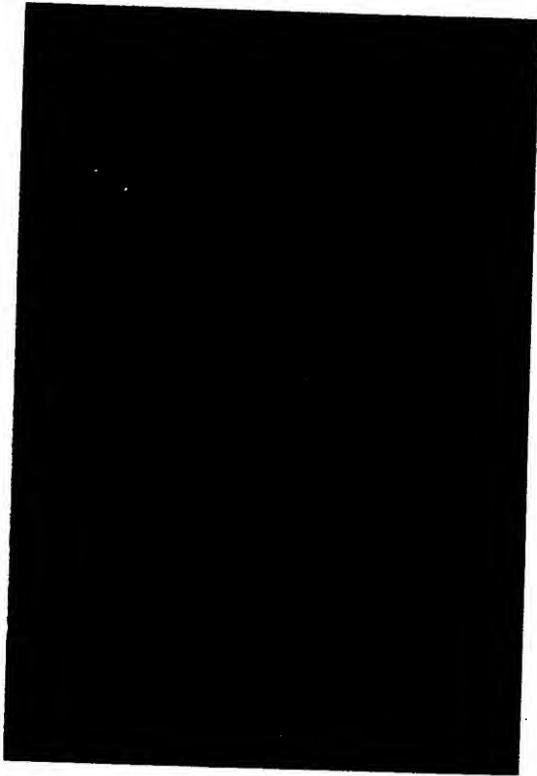


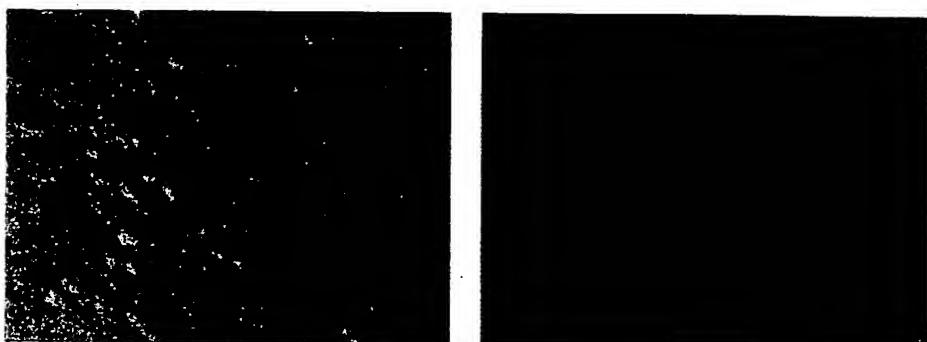
FIG. 3

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DIC

FITC

12 h



24 h



36 h

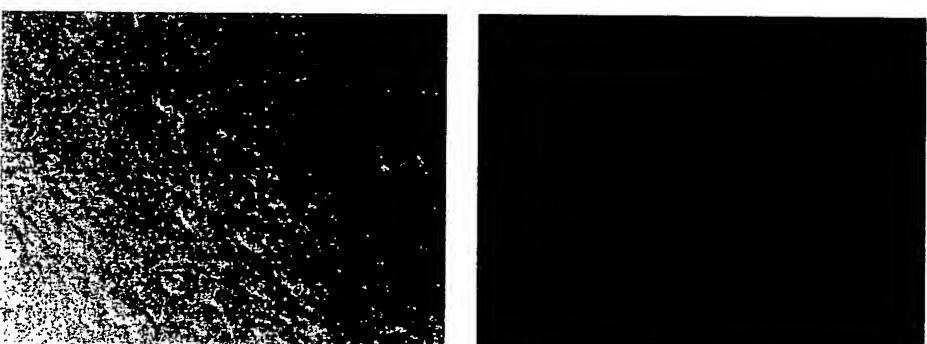


FIG. 4

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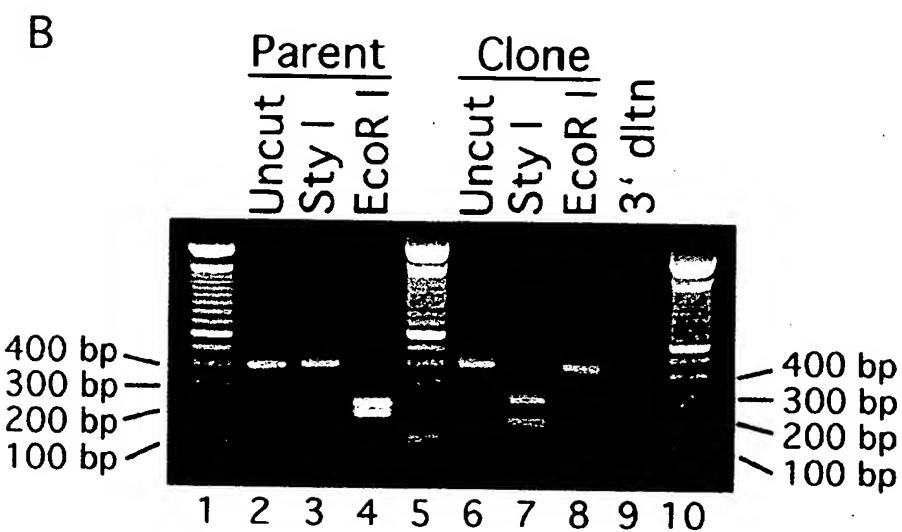
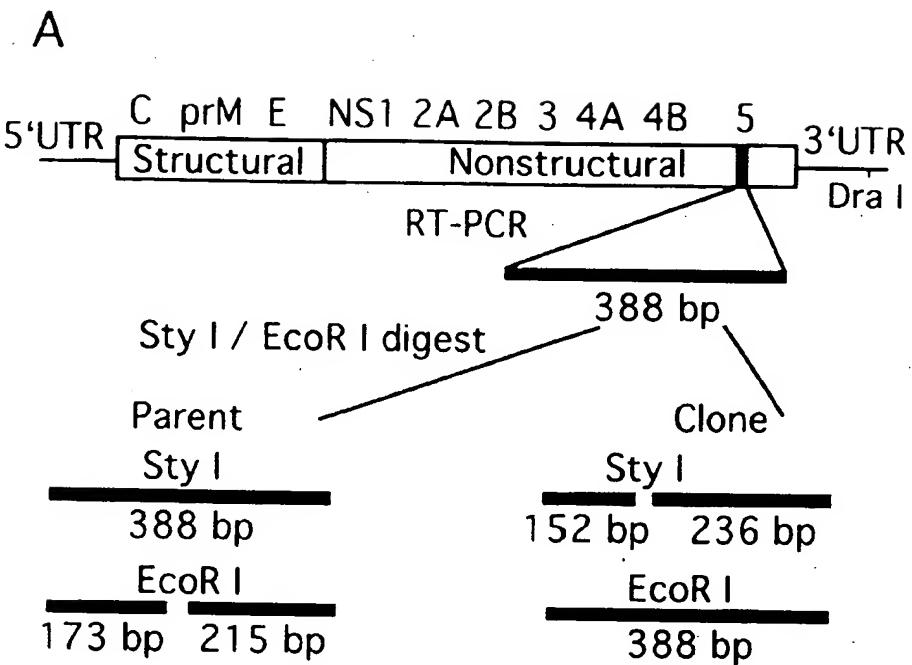
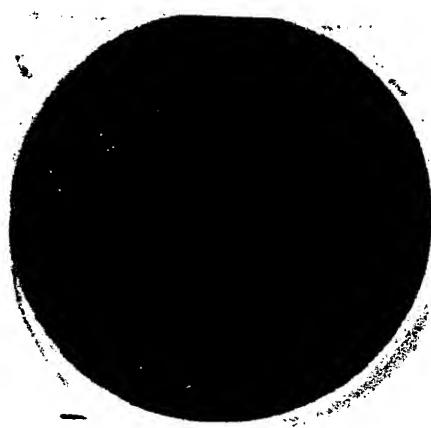


FIG. 5

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A



B

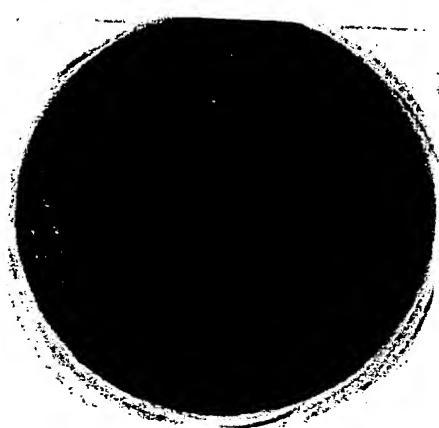


FIG. 6

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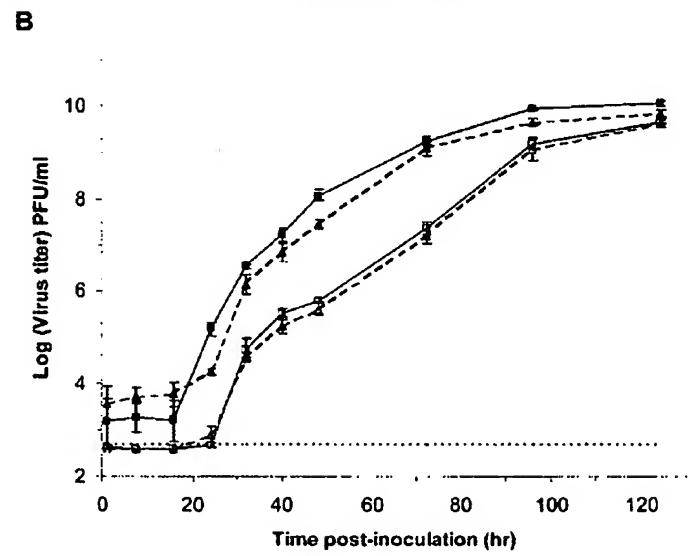
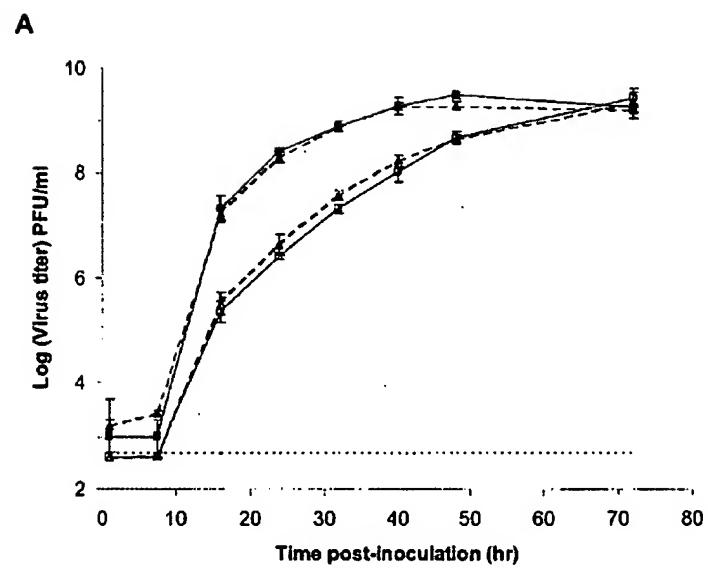


FIG. 7

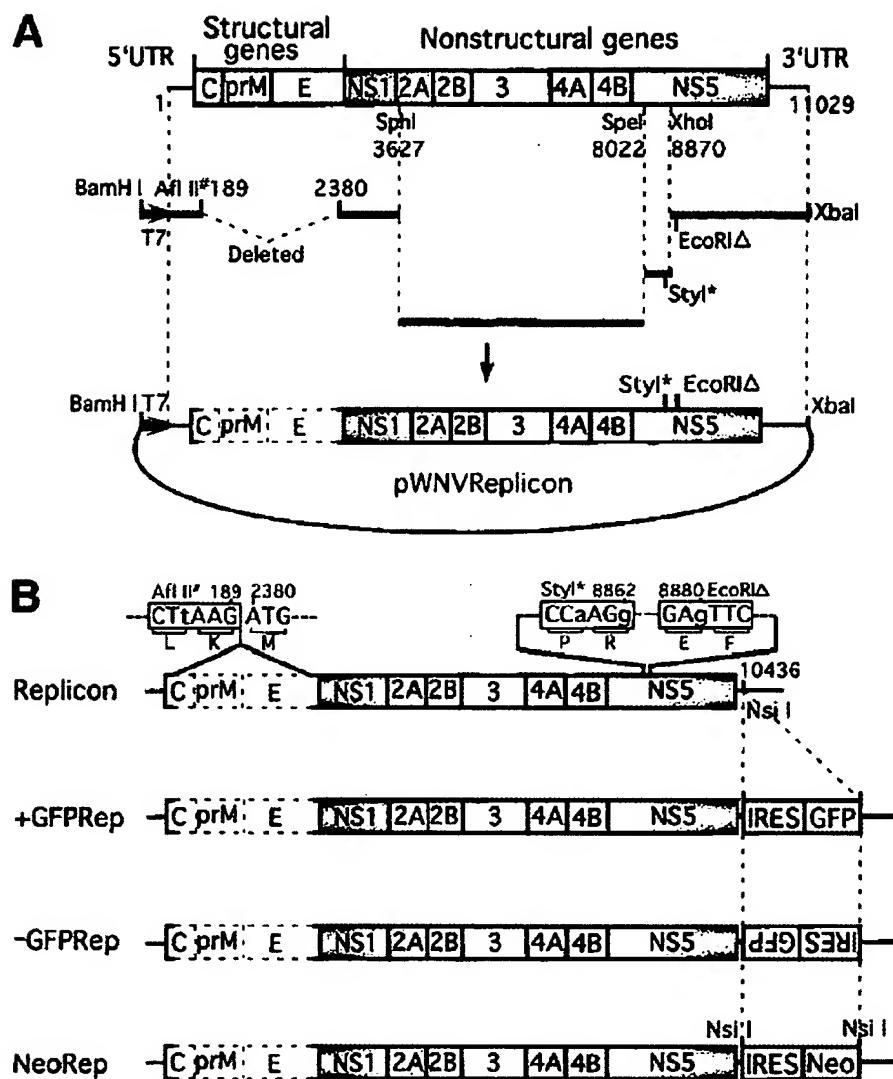


FIG. 8

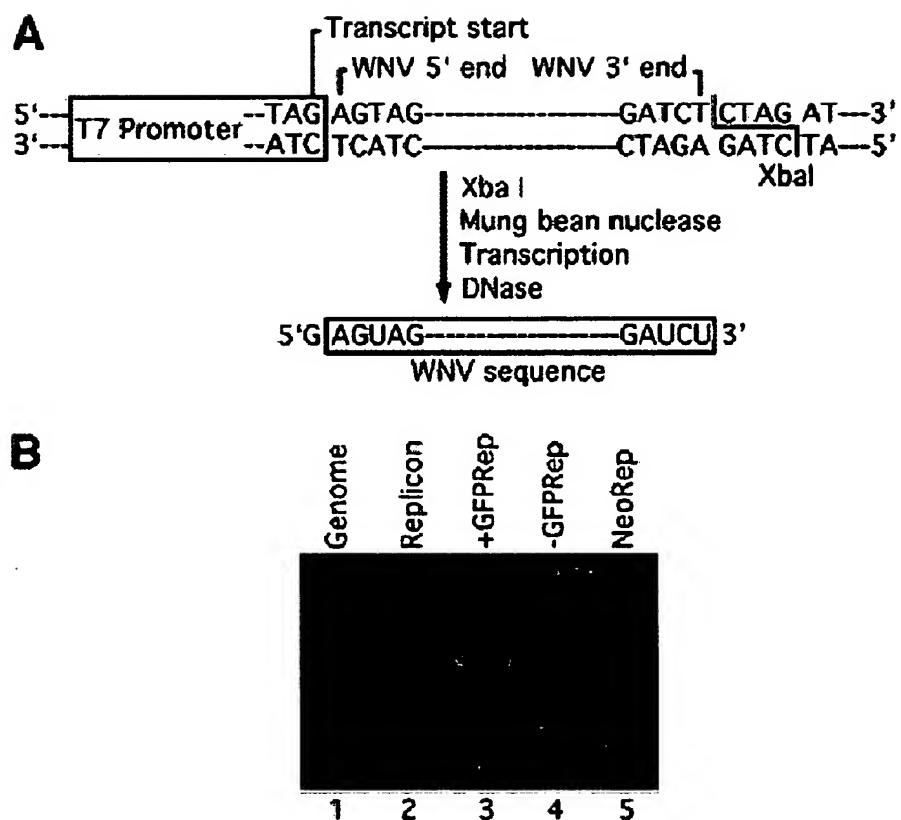


FIG. 9

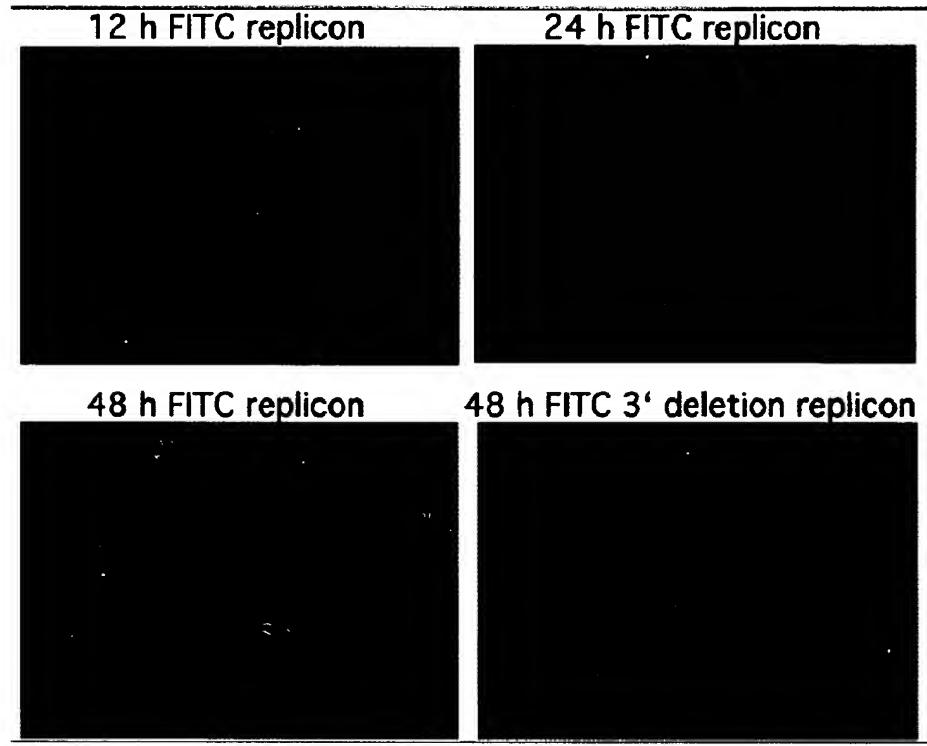


FIG. 10

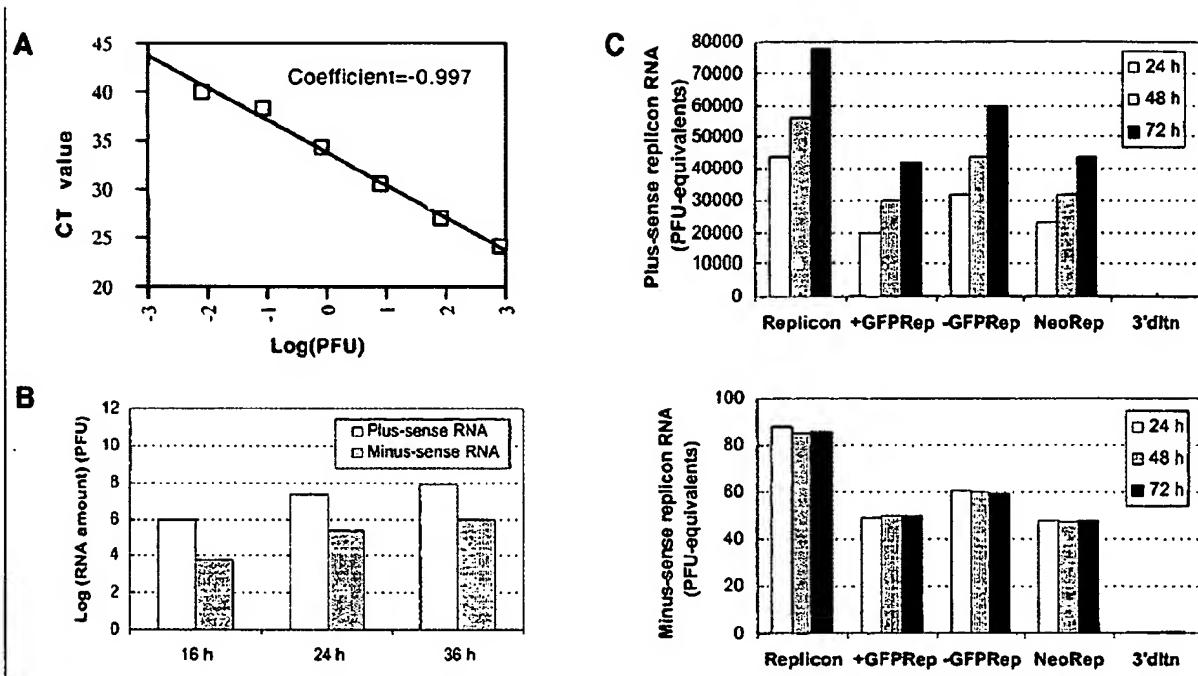


FIG. 11

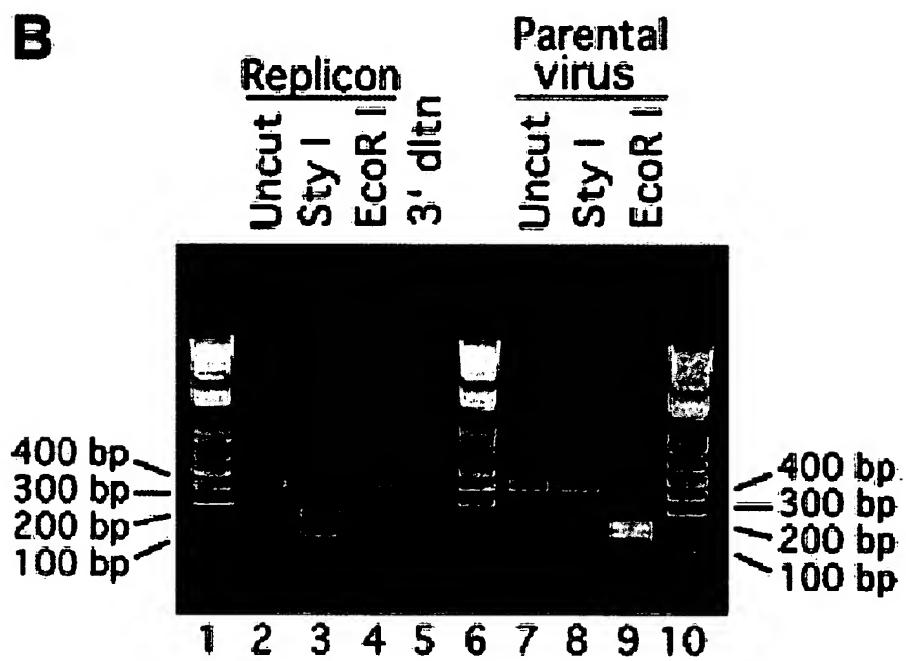
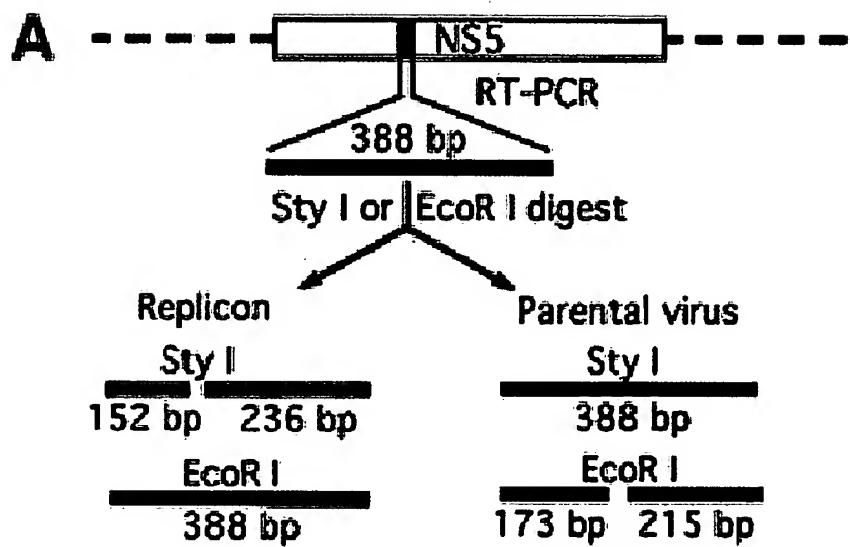


FIG. 12

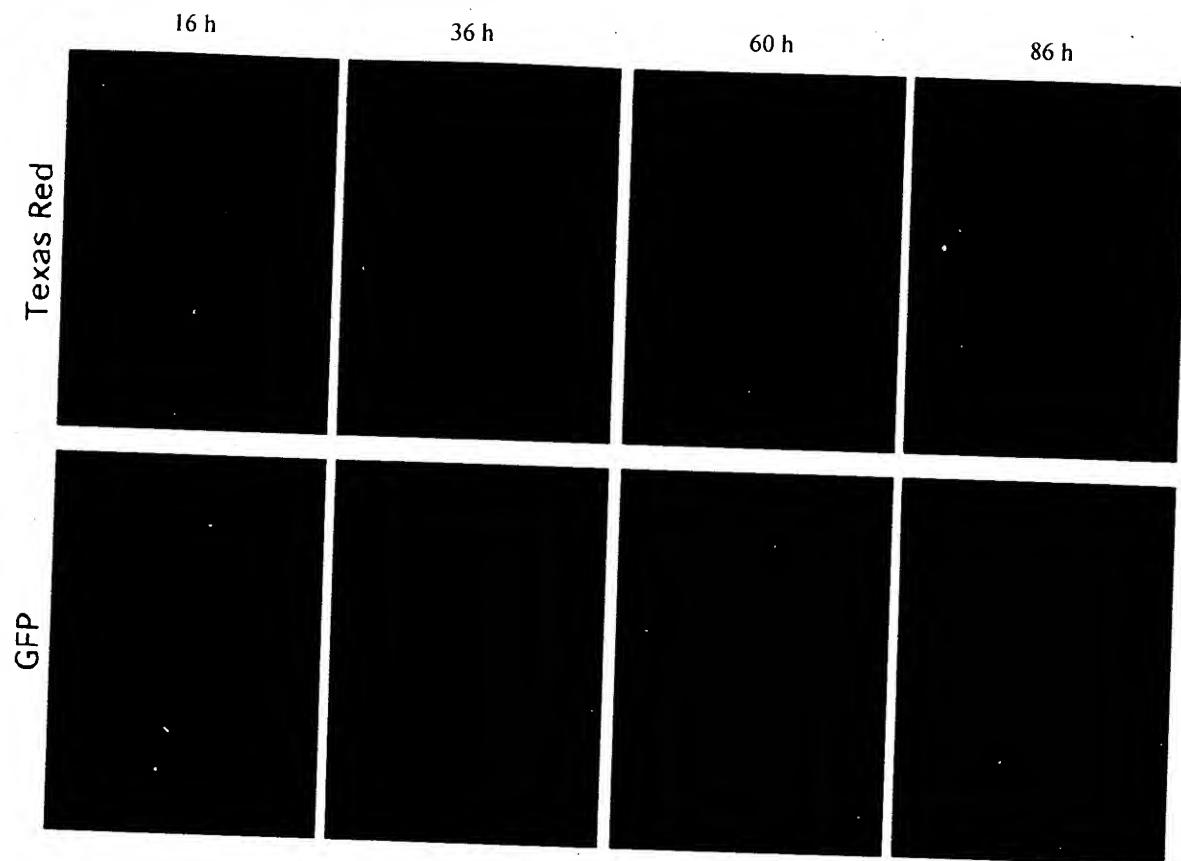


FIG. 13

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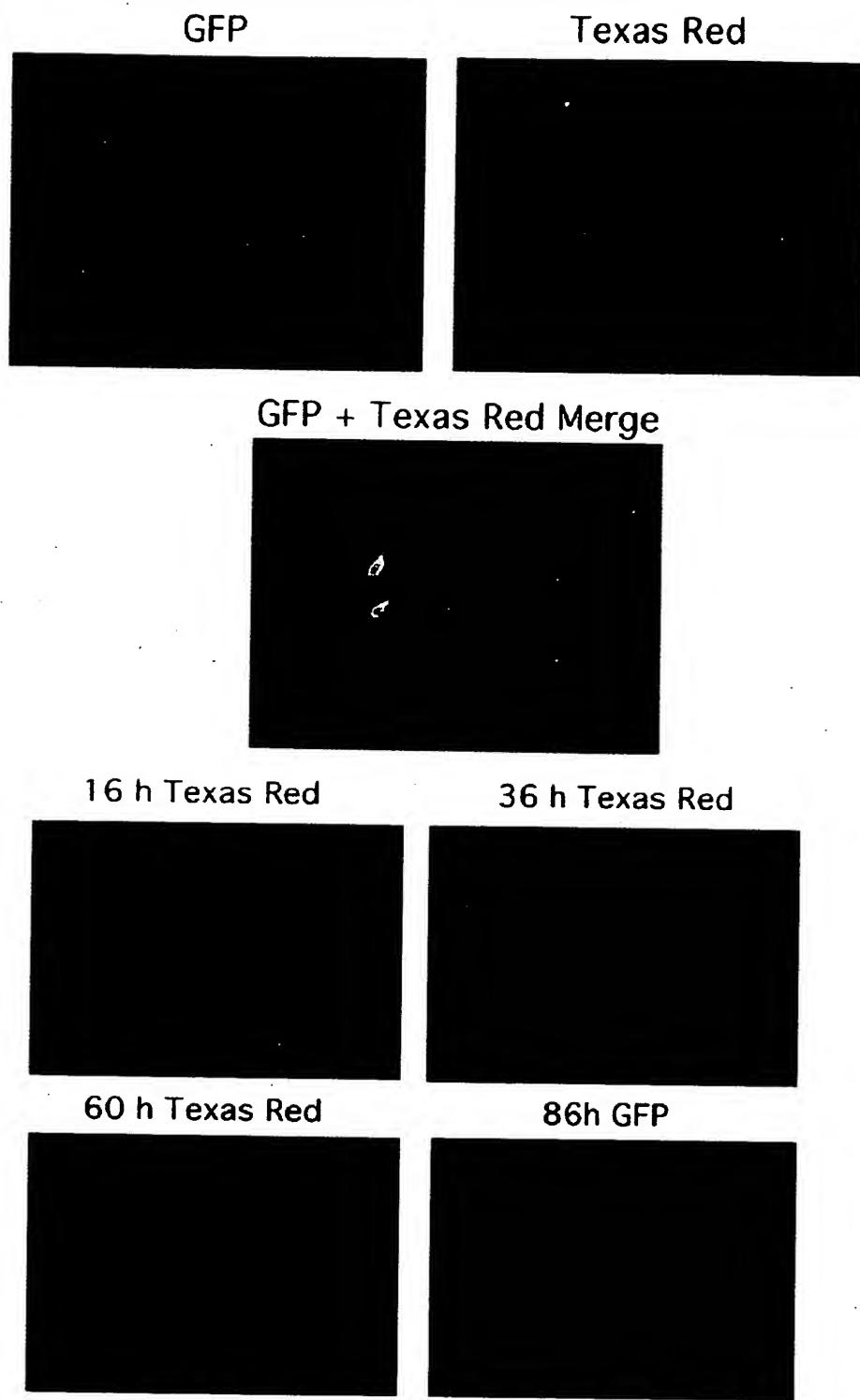


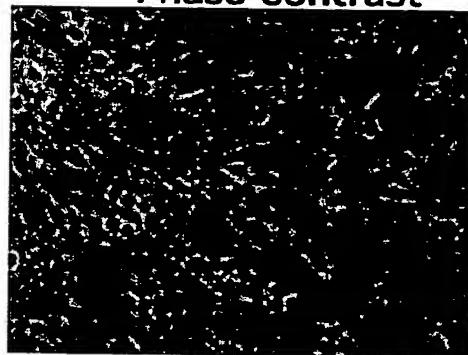
FIG. 14

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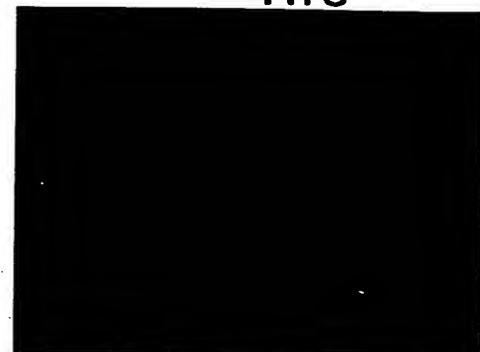
A

NeoRep transfected cells

Phase contrast



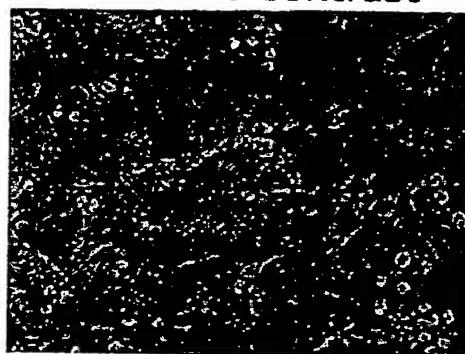
FITC



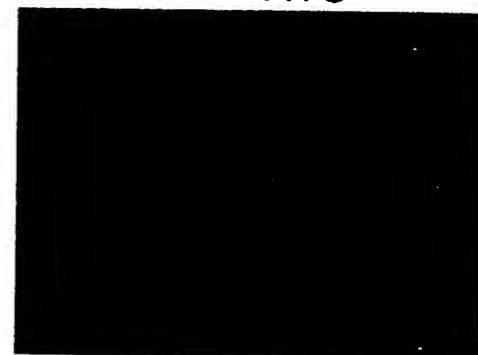
B

Neo selected NeoRep cells (15 days)

Phase contrast



FITC



Neo selected NeoRep cells (40 days)

DIC



FITC



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FIG. 15

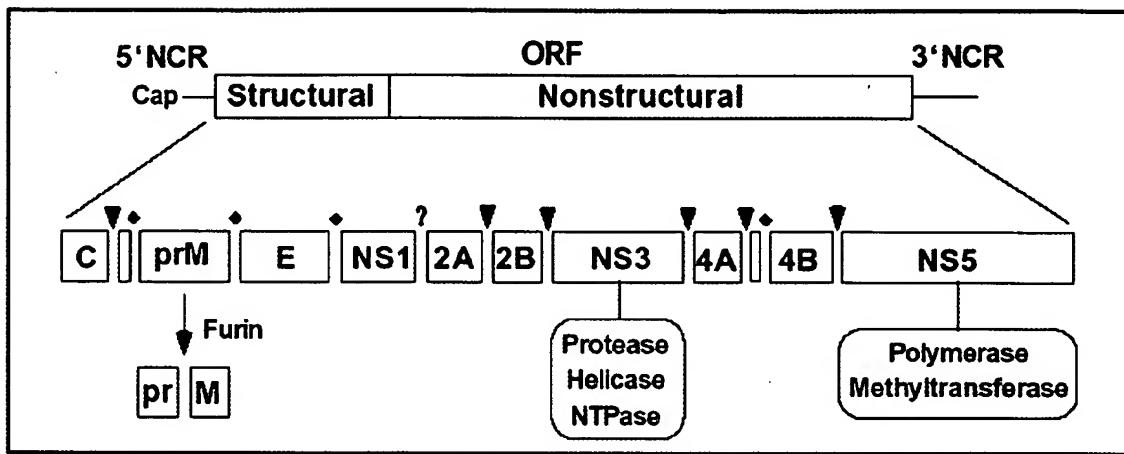


FIG. 16

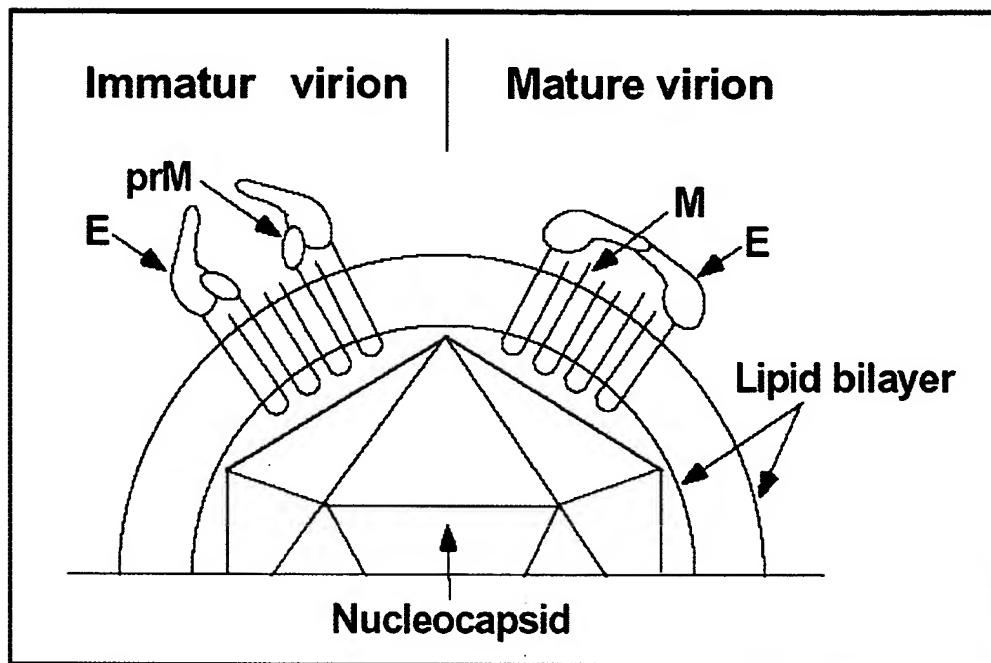


FIG. 17

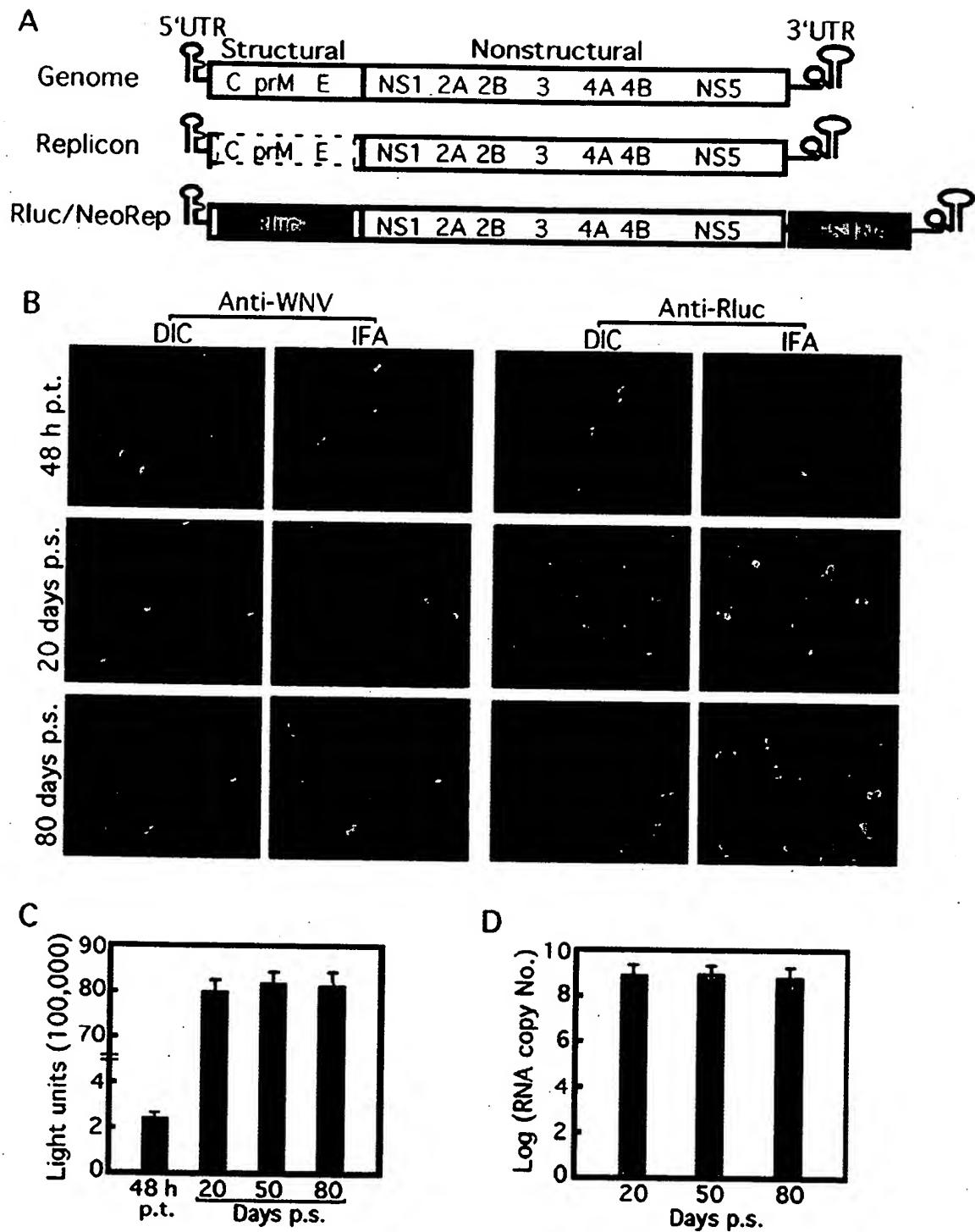


FIG. 18

BEST AVAILABLE COPY

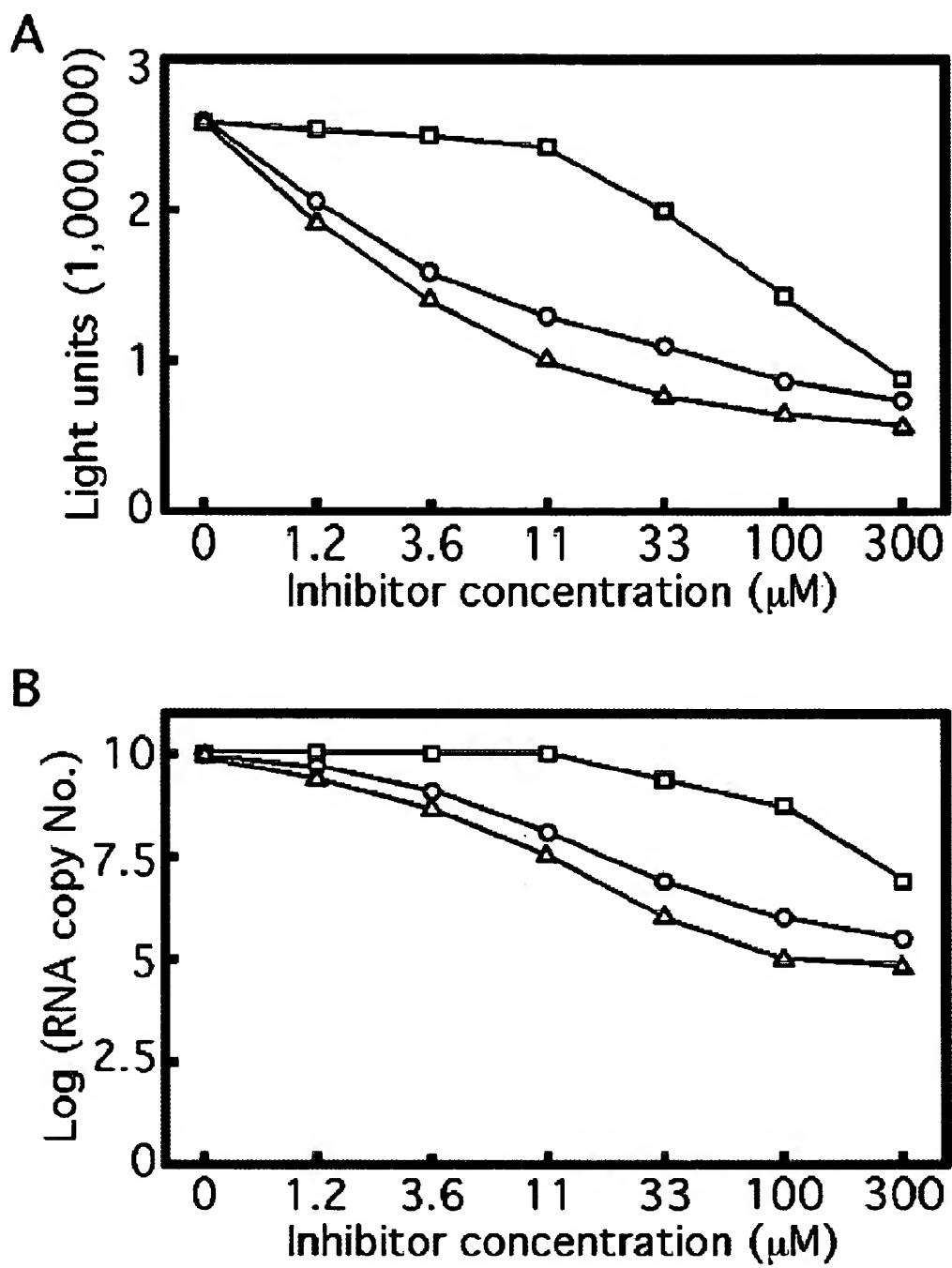


FIG. 19

Complete Nucleotide Sequence of Lineage I WNV Strain 3356 GenBank accession N . AF404756
(Nucleotide positions indicated in bold underline are different than corresponding positions of FIG. 2)

FIG. 20 a

```

1      agtagttcgc ctgtgtgagc tgacaaaactt agtagtgtt gtgaggatta acaacaatta
61     acacagtgcg agctgtttct tagcacgaag atctcgatgt ctaagaaacc aggagggccc
121    ggcacagagcc gggctgtcaa tatgctaaaa cgccgaatgc cccgcgtgtt gtccttgatt
181    ggactgaaga gggctatgtt gacccgtatc gacggcaagg ggccaataacg atttgtgttg
241    gctcttttgg cgttcttcag gttcacacgca attgctccga cccgagcagt gctggatcga
301    tggagaggtg tgaacaaaaca aacagcgatg aaacacccctc tgagtttaa gaaggaacta
361    gggaccccttga ccagtgttat caatcggcgg agtcacaaac aaaagaaaaag aggagggaaag
421    accggaaattt cagtcatgtat tggcctgatc gccagcgttag gagcagttac cctctctaacc
481    ttccaaggaa aggtgtatgat gacggtaaat gctactgacg tcacagatgt catcacgatt
541    ccaacagctg ctggaaagaa cctatgcattt gtcagagcaa tggatgtggg atacatgtgc
601    gatgatacta tcacttatga atgcccagtg ctgtcggctg gtaatgatcc agaagacate
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901    gggagcaaca ccatgcagag agttgttggt gtcgtctat tgcttttggt ggccccagct
961    tacagcttca actgccttgg aatgagcaac agagacttct tggaggaggt gtctggagca
1021   acatgggtgg atttggttct cgaaggcgac agtcgtgtca ctatcatgtc taaggacaag
1081   cctaccatcg atgtgaagat gatgaatatg gaggcggcca acctggcaga ggtccgcagt
1141   tattgttattt tggttaccgtt cagcgatctc tccacccaaag ctgcgtgccc gaccatggga
1201   gaagctcaca atgacaaaacg tgctgacccca gctttgtgtt gcaagacaagg agtgggtggac
1261   aggggcttggg gcaacggctg cggattattt ggcaaaaggaa gcattgacac atgcgcacaaa
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1381   gtggccatattt ttgtccatgg accaactact gtggagtcgc acggaaacta ctccacacag
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1501   aagcttggag aatatggaga ggtgacagt gactgtgaac cacggtcagg gattgacacc
1561   aatgcataact acgtgtatgac tggatggaca aagacgttct tggtccatcg tgagtgggtt
1621   atggacctca acctcccttgg gacgtgtct ggaagtactg tggggagaa cagagagacg
1681   ttaatggagt ttgaggaacc acacgcaccc aagcagtctg tgatagcatt gggctcacaa
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2341   tggataacgc aaggattgtt gggggctctc ctgttggat tggggatcaa tgctcgatgt
2401   aggtccatag ctctcacgtt tctcgatgtt ggaggagttc tgcttttccctt ctcgtgaaac
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3061   ctgtccattt ggatttggaaag caggctcaat gatacgtggat agttggaaag ggcagttctg
3121   ggtgaagtca aatcatgtac tggccgttag acgcataccct tggggccggat tggaaatccctt
3181   gagagtgtact tgataatacc agtcacactg gcgggaccac gaagcaatca caatcgagaa

```

Complete Nucleotide Sequence of Lineage I WNV Strain 3356 GenBank accession No. AF404756
(Nucleotide positions indicated in bold underline are different than corresponding positions of FIG. 2.)

FIG. 20 b

cctgggtaca agacacaaaa ccagggccca tgggacgaag gccgggtaga gattgactc
3301 gattactgcc caggaactac ggtcacccctg agtgagagct gcggacaccg tggacctgc
3361 actcgcccca ccacagagag cgaaagttt ataacagatt ggtgctgcag gagctgacacc
3421 ttaccaccac tgctgtacca aactgacagg ggctgttgg atggatgatgaa gatcagacca
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3601 aagagggtgg aagccaaatg cagcatgcca gctatactga ttgctctgct agtcctgttgc
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3961 ataacattca caacgacatc aaacgttggt gttccgtc tagccctgtc aacacccggg
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6241 ccagtttggc tggcttacaa gtttgcggc gtttgcggcgt ttttgcggcgttgcataccacca
6301 tgctttgtatgt gtccttaggac aaacacaatt ttagaaagaca acaacgaagt ggaagtcatc
6361 acgaagcttgc tggaaaggaa gattctgagg cccgcgttgc ttgacggccag ggtgtactcg

Complete Nucleotide Sequence of Lineage I WNV Strain 3356 GenBank accession No. AF404756
(Nucleotide positions indicated in bold underline are different than corresponding positions of FIG. 2.)

FIG. 20 c

4421 gatcaccagg cactaaaggc gttcaaggac ttgcctcgg gaaaacgttc tcagatagg
6481 ctcattgagg ttctggaaa gatgccttag cacttcatgg ggaagacatg ggaagactt
6541 gacaccatgt acgttgtggc cactgcagag aaaggaggaa gagctcacag aatggccctg
6601 gaggaactgc cagatgtct tcagacaatt gccttatttttgc ctttatttgag ttttgatgacc
6661 atgggagttat tcttcctcct catgcagcgg aaggcatttgc gaaaagatgg ttttgaggc
6721 gctgtcttgg gatgcgcac cttttctgt tggatggctg aagttccagg aacgaagatc
6781 gccggaatgt tgctgtctc ctttcttttgc atgattgtgc taattcctga gccagagaag
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6901 agcgcagtgg cagccaaacga gatgggttgg ctagataaga ccaagagtga cataaggcagt
6961 ttgtttggc aaagaatttgc ggtcaaggag aatttcagca tggagagtt ttttgcggc
7021 ttgaggccgg caacagcctg gtcactgtac gctgtacaa cagcggtctt cactccactg
7081 ctaaaagcatt tgatocacgtc agattacatc aacacctcat tggatgtcat aaacgttgc
7141 gcaagtgcac tattcacact cgcgcgaggc ttccccttgc tcgatgttgg agtgcggct
7201 ctcctgttag cagccggatg ctggggacaaa gtcaccctca ccgttacggt aacagcggca
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8701 accaccatgg ccatgactgc cactactccc ttccggcgc gagggtgttgc caaagagaag
8761 gtggacacga aagcttgc accggccagaa ggagtgaagt acgtgttgc cggacccacc
8821 aactgggttgc gggcggtttt ggcggagaaa aacgtccca gatgtgtc tcgagggagaa
8881 ttcataagaa aggtcaacag caatgcagct tgggttgc ttttttttttgc aaaaatggatgg
8941 tggaggaggc ccagagaggc agttgaagat ccaaaatggatggatggatggatgg
9001 cgcggaggcac atctgggggg ggaatgttgc acgttgcattt acaacatgttgc gggaaagaga
9061 gagaaaaaaac ccggagagtt cggaaaggcc aagggaagca gagccatttgc gttcatgttgc
9121 ctggagactc gctttcttgc gttcgaggctt ctgggttttgc tcaatgttgc ccactggctt
9181 ggaagaaaaga actcaggagg aggtgttgc ggcgttggcc tccaaaactt gggatgttgc
9241 ctgcgttgc gttggaccccg gcctgggggg aagatgttgc ctgtatgttgc acgttgcgttgc
9301 gacaccgcgc tcaacggagac tgacttggaa aatgttgc aatgttgc ttttttttgc
9361 ggggaaacatc ggcgttttgc caggccatc attgttgc ttttttttgc cttatgttgc
9421 aaagtgttgc gcccggcttc tgatggaa ggcgttggcc tccaaaactt gggatgttgc
9481 cagagggggc gttggaccaatg ttttttttgc gtttttttgc cttatgttgc
9541 cagctggtgc ggttggatggaa agggggagggc gtttttttgc cttatgttgc
9601 aaaaaaggaa aaggacccaa agtccggacc tggatgttgc aatgttgc gggatgttgc

Complete Nucleotide Sequence f Lineage I WNV Strain 3356 GenBank accession No. AF404756
(Nucleotide positions indicated in bold underline are different than corresponding positions of FIG. 2)

FIG. 20 d

9661 agccgcattgg ctgtcagtgg agatgactgt gtggtaaagc ccctggacga tcgcttgc
9721 acctcgctcc acttcctcaa tgctatgtca aaggttcgca aagacatcca agagtggaaa
9781 ccgtcaactg gatggtatga ttggcagcag gttccatttt gctaaacca tttcaactgaa
9841 ttgatcatga aagatggaag aacactggtg gttccatgcc gaggacagga tgaattggta
9901 ggcagagctc gcatatatctcc agggccgga tggAACgtcc gcgacactgc ttgtctggct
9961 aagtcttatg cccagatgtg gctgcttctg tacccatcaca gaagagacct gcggctcatg
10021 gccaacgcca ttgctccgc tgccttctgt aattgggtcc ctaccggaa aaccacgtgg
10081 tccatccatg caggaggaga gtggatgaca acagaggaca tggatggaggt ctggaaaccgt
10141 gtttggatag aggagaatga atggatggaa gacaaaaccc cagtggagaa atggagtgac
10201 gtcctatcatt cagaaaaacg agaggacatc tgggtggca gcctgattgg cacaagagcc
10261 cgagccacgt gggcagaaaa catccaggtg gctatcaacc aagtcaagac aatcatcgga
10321 gatgagaagt atgtggatta catgaggta ctaaagagat atgaagacac aactttggtt
10381 gaggacacag tactgttagat attaatcaa ttgtaaatag acaatataag tatgcataaa
10441 agtgttagtt tatagtagta tttagtggtg ttagtgtaaa tagttaagaa aattttgagg
10501 agaaagtca gcccggaaatg tccccccacc ggaagtttag tagacgggtgc tgcotgcac
10561 tcaacccca gaggactggg tgaacaaagc cgcaagtga tccatgttaag ccctcagaac
10621 cgtctcgaa ggaggacccc acatgttgta acttcaaagc ccaatgtcag accacgctac
10681 ggcgtgctac tctgcggaga gtgcagtctg cgatagtgcc ccaggagac tgggttaaca
10741 aaggcaaacc aacgccccac gcggccctag ccccgtaat gggttaacc agggcgaaag
10801 gactagaggt tagaggagac cccgcggtt aaagtgcacg gcccagctg gctgaagctg
10861 taggtcaggg gaaggactag aggttagtgg agacccctgt ccacaaaaca ccacaacaaa
10921 acagcatatt gacacctggg atagactagg agatcttctg ctctgcacaa ccagccacac
10981 ggcacagtgc gccgacaatg gtggctggtg gtgcgagaac acaggatct
//

C mplete Nucleotide Sequence f Fully-Infecti us Lineage I WNV cDNA Cl ne of Strain 3356
(Nucleotide positions different from FIG. 20 are shown in bold underline)

FIG. 21 a

1 agtagttcgc ctgtgtgagc tgacaaaactt agtagtgtt gtgaggattt acaacaatta
61 acacagtgcg agctgtttct tagcacgaag atctcgatgt ctaagaaaacc aggagggccc
121 ggcaagagcc ggctgtcaa tatgtaaaaa cgccgaatgc cccgcgtgtt gtccttgatt
181 ggactgaaga ggctatgtt gagcctgatc gacggcaagg ggccaatacag atttgtgttg
241 gctctttgg cgttcttcag gttcacagca attgtccga cccgagcagt gctggatcga
301 tggagaggtg tgaacaaaca aacagcgatg aaacacccctc tgagttttaa gaaggaacta
361 gggacccctga ccagtgcstat caatcggcgg agctaaaaac aaaagaaaaag aggagggaaag
421 accggaaattt cagtcatgtat tggcctgatc gccagcgtag gaggcgttac cctctctaacc
481 ttccaaggga aggtgtatgtat gacggtaaat gctactgac tcacagatgt catcacgatt
541 ccaacagctg ctggaaagaa cctatgcatt gtcagagcaa tggatgtggg atacatgtgc
601 gatgatacta tcaacttatga atgcccagtg ctgtcggctg gtaatgatcc agaagacatc
661 gactgttggt gcacaaaagtc agcagtctac gtcaggtatg gaagatgcac caagacacgc
721 cactcaagac gcagtcggag gtcactgaca gtgcagacac acggagaaag cactctagcg
781 aacaagaagg gggcttggat ggacagcacc aaggccacaa ggtattttgtt aaaaacagaa
841 tcatggatct tgaggaaccc tggatatgcc ctgttggcag cccgtcatgg ttggatgctt
901 gggagcaaca ccatgcagag agttgtttt gtcgtctat tgcttttgtt gccccagct
961 tacagcttca actgccttgg aatgagcaac agagacttct tggaaaggagt gtctggagca
1021 acatgggtgg atttgggtct cgaaggcgc acgtgcgtga ctatcatgtc taaggacaag
1081 cctaccatcg atgtgaagat gatgaatatg gaggcggcca acctggcaga ggtccgcagt
1141 tattgttatt tggctaccgt cagcgtatctc tccaccaaag ctgcgtgccc gaccatggga
1201 gaagctcaca atgacaaaacg tgctgaccca gcttttgtt gcagacaagg agtgggtggac
1261 aggggcttggg gcaacggctg cggatattt ggcaaaggaa gcattgacac atgcgc当地
1321 tttgcctgct ctaccaaggc aataggaaga accatcttga aagagaatat caagtacgaa
1381 gtggccattt ttgtccatgg accaactact gtggagtcgc acggaaacta ctccacacag
1441 gttggagcca ctcaggcagg gagattcagc atcaactcctg cggcccttc atacacacta
1501 aagcttggag aatatggaga ggtgacagtg gactgtgaac cacggtcagg gattgacacc
1561 aatgcatact acgtgtatgac ttttggaaaca aagacgttct tggtccatcg tgagtgggtt
1621 atggacacta acctccctt gggcgtctg gggcgtctg ggaagttactg tttggagggaa cagagagacg
1681 ttaatggagt ttgaggaacc acacgcccacg aagcagtctg tgatagcatt gggctcacaa
1741 gagggagctc tgcatcaagc ttttggcttgg gccattcctg tggaaattttc aagcaacact
1801 gtcaagttga cgtcgggtca ttttggatgtt agagtgaaga tggaaaaattt gcaaggtaag
1861 ggaacaacctt atggcgtctg ttcaaggctt tttttttt tttttttt tttttttt tttttttt
1921 ggtcacggca ctgttgggtt ggaatttgcag tacactggca cggatggacc ttgtaaagtt
1981 cctatctcgt cagtggcttcc attgaacgc ctaacgcccac tggccatgtt ggtcaactgtc
2041 aacccttttgc ttttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt
2101 ttttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2161 aagtctggaa gcacgttgg cttttttt cttttttt cttttttt cttttttt cttttttt
2221 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2281 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2341 tggataacgc aaggatttgc tttttttt cttttttt cttttttt cttttttt cttttttt
2401 aggtccatag ctctcacgtt tttttttt cttttttt cttttttt cttttttt cttttttt
2461 gtgcacgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2521 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2581 acggccacaag gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt
2641 cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2701 cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2761 aagtctggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2821 tggataacgc aaggatttgc tttttttt cttttttt cttttttt cttttttt cttttttt
2881 cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
2941 tttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
3001 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
3061 acggccacaag gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt
3121 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt
3181 gggcgttggatgtt cttttttt cttttttt cttttttt cttttttt cttttttt cttttttt

Complete Nucleotide Sequence of Fully-Infectious Lineage I WNV cDNA Clone of Strain 3356
(Nucleotide positions different from FIG. 20 are shown in bold underline)

FIG. 21 b

cctgggtaca agacacaaaa ccagggccca tgggacgaag gccgggtaga gattgacttc
3301 gattactgcc caggaactac ggtcaccctg agtgagagct gcggacaccg tggacctgc
3361 actcgcacca ccacagagag cgaaagttt ataacagatt ggtgctcgag gagctgcacc
3421 ttaccaccac tgcgctacca aactgacagc ggctgttgg atgttatgga gatcagacca
3481 cagagacatg atgaaaagac cctcgtcgac tcacaagtta atgcttataa tgctgatatg
3541 attgaccctt ttcatgttggg cttctggc gtgttcttgg ccacccaggaa ggtccttcgc
3601 aagaggttga cagccaagat cagcatgcca gctatactga ttgctctgct agtcctgttgc
3661 ttgggggca ttacttacac ttagtgttta cgctatgtca tcttggggg ggcagcttcc
3721 gcagaatcta attcgggagg agacgttggta cacttggcgc tcatggcgac cttcaagata
3781 caaccagtgt ttatgttggc atcgtttctc aaagcgagat ggaccaacca ggagaacatC
3841 ttgttgatgt tggcgctgt ttctttcaa atggcttatac acgatgcccgg ccaaattctg
3901 ctctgggaga tccctgtatgt gttagattca ctggcgtag ctggatgtatgt
3961 ataacattca caacgacatc aaacgttggt gttccgtc tagccctgtct aacacccggg
4021 ctgagatgtc tgaatcttga tttgtacagg atactgtgt tgatggtcgg aataggcagc
4081 ttgatcaggag agaagaggag tgcagctgca aaaaagaaaag gagcaagtct gctatgttgc
4141 gctctggct caacaggact ttcaaccccc atgatcttgc tgctggact gattacatgt
4201 gatcccaacc gtaaacgcgg atggcccgca actgaatgtga tgacagctgt cggcctgtatgt
4261 ttgcgcacatcg tcggagggtt ggcagagctt gacattgtact ccatggccat tccaatgact
4321 atcgcggggc tcatgttgc tgcttctgttgg atttctgggaa aatcaacacaa tatgtggatt
4381 gagagaacgg cggacattt ctggggaaagt gatgcagaaa ttacaggctc gagcgaaga
4441 gttgtatgtgc ggcttgcattgt tgatggaaac ttccagctca tgaatgtatcc aggacac
4501 tggaaagatataat ggatgtctcg aatggtctgt ctcgcgatta gtgcgtacac cccctggca
4561 atcttgcctt cagtagttgg attttggata actctccaat acacaaagag aggaggcgt
4621 ttgtgggaca ctccctcacc aaaggagttac aaaaaggggg acacgaccac cggcgttac
4681 aggatcatgtc ctctggggct gctcggcgat tatcaagcag gagcggggcgt gatgttggaa
4741 ggtgtttcc acacccttgc gcatacaacaa aaaggagccg cttgtatgag cggagaggc
4801 cgcctggacc catactgggg cagtgtcaag gaggatcgac ttgttacgg aggacccctgg
4861 aaattgcagc acaagtggaa cgggcaggat gaggtgcaga tgattgttgg ggaacctggc
4921 aagaacgttta agaacttca gacgaaacca ggggtttca aaacacccatc aggagaatc
4981 gggggccgtga ctggactt ccccaacttga acatcaggct caccatagt ggacaaaac
5041 ggtgtatgtga ttgggcttta tggcaatggc gtcataatgc ccaacggctc atacataac
5101 gcgatagtgc agggtaaaag gatggatgag ccaatcccag cgggattcga acctgagatg
5161 ctgaggaaaa aacagatcac tttactgttgc ctccatcccc ggcgggttta aacaaggagg
5221 attctgcac agatcatcaa agaggccata aacagaagac tgagaacagc cgtctagca
5281 ccaaccagggg ttgtggctgc tgagatggct gaagcactga gaggactgccc
5341 cagacatccg cagtggcccg agaaacataat gggaaatgaga ttgttgcattt catgtgtcat
5401 gtcacccctca cccacaggct gatgtctctt cacagggtgc cgaactacaa cctgttgc
5461 atggatgagg ctcatcacc cggccaggct acgttgcag caagaggta catttccac
5521 aaggtcgagc tagggaggc ggcggcaata ttcatgacag ccacccccc accggacttca
5581 gatccattcc cagagtccaa ttccaccaatt tccgacttac agactgagat cccggatcga
5641 gcttggact ctggatacga atggatcaca gaatacaccg ggaagacgggt ttgggttgc
5701 cctagtgtca agatggggaa tgagatttgc ctttgcctac aacgtgttgg aagaaaatg
5761 gtccaaatttgc acagaaatgc gtacgagac gaggatccaa aatgtaaagaa cgtatgttgg
5821 gactttgttta tcacaacaga catatcttgc atggggcttactttaaggc gggcgggttgc
5881 attgacagcc ggaagagtgt gaaaccaacc atcataacag aaggagaagg gagagtgtatc
5941 ctgggagaac catctgcagt gacagcaggct agtggccccc agagacgttgg acgtatcggt
6001 agaaatccgt cgcaagttgg tgatgttgc tttatgggg ggcacacggaa tgaagac
6061 tcgaacttgc cccatggac tgaggcacga atcatgttgg acaacatcaa catgccaac
6121 ggactgtatcg ctcaatttca ccaaccaggag cgtgagaagg tatataccat ggatggggaa
6181 taccggctca gaggagaaga gaaaaaaac ttcttgcac ttttgcac gggcgggttgc
6241 ccagtttggc tggcttacaa ggttgcaggc gctggagtgt cataccacca cccggagggt
6301 tgcttgcattgt gtccttgcattttt gtttgcac gggcgggttgc ttttgcac
6361 acgaaagcttgc tgaaaggaa gattcttgcagg cccggcgttgc ggttgcacttgc

Complete Nucleotide Sequence of Fully-Infectious Lineage I WNV cDNA Clone of Strain 3356
(Nucleotide positions different from FIG. 20 are shown in bold underline)

FIG. 21 c

6421 gatcaccagg cactaaaggc gttcaaggac ttgcgcctcg gaaaaacgttc tcagataggg
6481 ctcattgagg ttctggaaa gatgcctgag cacttcatgg ggaagacatg ggaagcactt
6541 gacaccatgt acgttgtggc cactgcagag aaaggaggaa gagtcacag aatggccctg
6601 gaggaactgc cagatgctct tcagacaatt gccttatttg ctttatttgatgacc
6661 atgggagtat tcttccctt catgcagcgg aaggcattt gaaagatagg tttgggaggg
6721 gctgttttgg gactgcgcac ctttttctgt tgatggctg aagttccagg aacgaagatc
6781 gccggaatgt tgctgtctc ccttcttgg atgatgtgc taattccctga gccagagaag
6841 caacgttcgc agacagacaa ccagctagcc gtgttccctga tttgtgtcat gacccttgg
6901 agcgcagtgg cagccaaacga gatgggttgg ctagataaga ccaagagatgataa
6961 ttgtttggc aaagaattga ggtcaaggag aatttcagca tgggagatgt tctt**T**tggac
7021 ttgagggccgg caacagcctg gtcactgtac gctgtgacaa cagcggctt cactccactg
7081 ctaaagcatt tgcacatgtc agattacatc aacacccat tgcacccat aacagttcag
7141 gcaagtgcac tattcacact cgccgcgaggc ttcccctcg tgcgtgttgg agtgcggct
7201 ctcctgttag cagccggatg ctggggaccaa gtccacccatca ccgttacggt aacagcggca
7261 acactccctt tttgccacta tgcctacatg gttcccggtt ggcaagctga ggcaatgcgc
7321 tcagccccggc ggcggacagc ggccggaaatc atgaaagaacg ctgttagtgg tggcatcg
7381 gccacggacg tcccagaattt agagcgcacc acacccatca tgcagaagaa agttggac
7441 atcatgtca tcttgggtgc tctagctgca gtagtgcgtt acccgctgtt gaagacagta
7501 cgagaagccg gaattttgtat cacggccgca gcggtgacgc tttggggagaa tggagcaagc
7561 tctgttttggc acgcaacaac tgccatcgga ctctgccaca tcatgcgtgg gggttgggtt
7621 tcatgtctat ccataaacatg gacactcata aagaacatgg aaaaaccagg actaaaaa
7681 ggtggggcaaa aaggacgcac ctggggagag gttggaaag aaagactcaa ccagatgaca
7741 aaagaagatgt tcaacttaggtt cccaaagag gccatcatcg aagtcgatcg ctcagcagca
7801 aaacacgcca ggaaagaagg caatgCcact ggagggcattc cagtctctag gggcacagca
7861 aaactgagat ggctggtcga acggagggtt ctgcacccgg tcggaaaagt gattgacctt
7921 ggtgtggaa gaggcggtt gtttactat atgcaaccc aaaaagagt ccaagaagtc
7981 agagggtaca caaaggggcg gttccggacat gaagagcccc aactagtgc aagtatgg
8041 tggAACATTG tcaccatgaa gatgtggAgtg gatgtttt acagacccatc tgatgttgg
8101 gacaccctcc tttgtgacat cggagagtcc tcgtcaagtgc tgagggttga agagcatagg
8161 acgattcggg tccctgaaat gtttggggacat tggctgcacc gggggcaag ggaattttgc
8221 gtgaagggtgc tctggcccta catgcccggaa gtcatacgaga agatggagct gctccaacgc
8281 cggtatgggg gggactggc cagaaaccca ctctcacggg attccacgca cgagatgtat
8341 tgggtgagtc gagtttcagg caatgtggta cattcagtga atatgaccag ccagggtgtc
8401 cttaggaagaa tggaaaaaaag gacctggaaag ggaccccaat acgagggaaa tgtaaactt
8461 ggaagtggaa ccaggccgtt gggaaaaccc ctgtcaact cagacaccag taaaatcaag
8521 aacaggattt aacgactcag gcgtgagttc agttcgacgt ggcaccacga tgagaaccac
8581 ccatatagaa cctggaaacta tcacggcagt tatgtgtga agcccacagg ctccggcagt
8641 tcgctggtca atggagtggc caggcttc tcaaaaccat gggacccat cacgaatgtt
8701 accaccatgg ccatgactga cactactccc ttccggcaggc agcgagtgtt caaagagaag
8761 gtggacacga aagcttctgaa accggccggaa ggagtgaagt acgtgtctaa cgagaccacc
8821 aactgggtgtt gggcggtttt ggccagagaa aaacgtccAa gGatgtgtc tcgagagggG
8881 ttcataagaa aggtcaacag caatgcacgt ttgggtggca tggggatggaa gcagaatcaa
8941 tggaggagcg ccagagggc agttgaagat cccaaatttt gggagatggt ggttgggg
9001 cgcgaggcact atctgcgggg ggaatgtcac acttgcattt acaacatgtat gggaaaagaga
9061 gagaaaaaaac ccggagagtt cggaaaggcc aaggaaagca gagccattt gttcatgtgg
9121 Tgctttctggc gttcgaggct ctgggttttcaatgaaga ccactgtgtt
9181 ggaagaaaaga actcaggagg aggtgtcgag ggcttggcc tccaaaaact gggttacatc
9241 ctgcgtgaag ttggcaccccg gcctggggcc aagatctatg ctgtatgcac agctggctgg
9301 gacaccggca tcacggagac tgacttggaa aatgaagcta aggtgtctga gctgtttgt
9361 gggggacatc ggcgttgc caggccatc attggatgtca cctatcgatca caaagttgt
9421 aaagtgtgc gcccggctgc tgatggaaaga accgtcatgg atgttatctc cagagaagat
9481 cagagggggc gtggacaagt tgtcacccatc gccctaaaca ctttcacccaa cctggccgtc
9541 cagctggtgc ggtatgtggc aggggaaagga gtgattggcc cagatgtatgg gggaaaactc
9601 acaaaaggaa aaggacccaa agtcaggacc tggctgtttt agaatggggaa agaaagactc

C_mplete Nucleotide Sequence of Fully-Infectious Lineage I WNV cDNA Clone_f Strain 3356
(Nucleotide positions different from FIG. 20 are shown in bold underline)

FIG. 21 d

9661 agccgcatgg ctgtcagtgg agatgactgt gtggtaaagc ccctggacga tcgccttgcc
9721 acctcgctcc acttcctcaa tgctatgtca aagttcgca aagacatcca agagtggaaa
9781 cccgtcaactg gatggtatga ttggcagcag gttccatttt gctcaaacca tttcaactgaa
9841 ttgatcatga aagatggaag aacactggtg gttccatgcc gaggacagga tgaattggta
9901 ggcagagctc gcataatctcc aggggccgga tggAACgtcc ggcacactgc ttgtctggct
9961 aagtctttag cccagatgtg gctgcttctg tacttccaca gaagagacct gcccgtcatg
10021 gccaacgcca tttgctccgc tgccctgt aattgggtcc ctaccggaa acccacgtgg
10081 tccatccatg caggaggaga gtggatgaca acaggagaca tggatgggt ctggaaaccgt
10141 gtttggatag aggagaatga atggatggaa gacaaaaaccc cagtggagaa atggagtgac
10201 gtcggatattt cagggaaaacg agaggacatc tgggtgtggca gcctgatgg cacaagagcc
10261 cgagccacgt gggcagaaaa catccaggtg gctatcaacc aagtccagac aatcatcgga
10321 gatgagaagt atgtggatta catgagttca ctaaagagat atgaagacac aactttggtt
10381 gaggacacag tactgttagat atttaatcaa ttgtaaatag acaatataag tatgcataaaa
10441 agtgtagttt tatagttagta tttagtgggt ttagtgtaaa tagttaagaa aattttgggg
10501 agaaaagtccag gcccggaaatg tcccggccacc ggaagtttag tagacgggtgc tgcctgcgac
10561 tcaaccccgag gaggactggg tgaacaaagc cgcgaagtga tccatgttaag ccTcagaac
10621 cgtctcgaa ggaggacccc acatgttgta acttcaaagc ccaatgtcag accacgtac
10681 ggcgtgtac tctcgggaga gtgcagtctg cgatagtgcc ccaggaggac tgggttaaca
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